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INITIAL CJR **DATE** 9/1/04

DECISION DOCUMENTATION PACKAGE
COVER SHEET

Prepared in accordance with

TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT THE INEEL

Site Description: **Shallow Injection Wells Located at INTEC**

Site ID: **CPP-102, CPP-103, CPP-109, CPP-110** **Operable Unit:** **3-13**

Waste Area Group: **3**

I. SUMMARY – Physical description of the site:

In January 2003, Bechtel BWXT Idaho, LLC (BBWI) completed an evaluation of 36 shallow injection wells (SIWs) located at the Idaho National Engineering and Environmental Laboratory (INEEL). This evaluation presented the status and the abandonment plan for each SIW and was approved by the Idaho Department of Water Resources.[1] These 36 SIWs included nine located at the Idaho Nuclear Technology and Engineering Center (INTEC) facility with the abandonment plan to include evaluation under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA).

To facilitate the evaluation of the SIWs, this Track 1 document evaluates four of the nine SIWs that received similar waste during their operation. Specifically, these four wells received discharges of steam condensate from the steam system at INTEC. The INTEC steam system consisted of two boiler plants (CPP-606 and –687), which supplied steam to various buildings and installations throughout INTEC. CPP-606, the Service Building Powerhouse, is still in service; while CPP-687, the Coal Fired Boiler House, was in operation from 1984 until 1999. Information associated with buildings and systems that discharged to the individual wells is described below. The other five wells will be evaluated under a separate Track 1 Decision Document.

Various names and numbers are used to identify these SIWs. For identification purposes, they are identified by the CERCLA site number, followed by the Record Number – Facility number, the IDWR record number, then the well name in parentheses.

CPP-102; 4-CPP; #54; (CPP-621-4)
This SIW is north of Building CPP-617 and south of the Fuorinel Dissolution Process and Fuel Start (FAST) hydrofluoric acid tank (CPP-727) (see Attachment 1). This well received condensate from Building CPP-607's heating system and was believed to have received condensate from a steam line used to steam trace the hydrofluoric acid tank. Steam heated tracing systems are used to keep chemicals flowing freely in all weather. The SIW is a precast concrete manhole with a 6-in. drain hole cored through the manhole bottom. It is not longer in use and there are no plans for future use. All piping leading to the SIW from CPP-607 and CPP-727 was removed and it has been fitted with a manhole cover (MAH-CS-LS-091).

CPP-103; no Record Number-Facility; no IDWR Record Number; (MAH-CA-CT-319)
This SIW was located south of Building CPP-656 and north of Building CPP-665 (see Attachment 2). It served Building CPP-665, a 19,200-ft^2 office building currently planned for deactivation and demolition. The SIW received steam condensate from the heating and ventilation equipment located inside CPP-665 and was placed in inactive status during 2001. During the construction project to deactivate CPP-665, the SIW was removed, the condensate line was partially removed and capped, and the area was backfilled with gravel. Building CPP-665 is scheduled for dismantling during 2004.

I. SUMMARY – Physical description of the site (continued):

CPP-109; 27-ICPP; #67; (CPP-IDHW-67)
This SIW is southwest of the Waste Calcining Facility, CPP-633 (see Attachment 3). It received steam condensate from CPP-633's heating and ventilation system. Building CPP-633, a 17,250-ft^2 facility, was decommissioned and a closure cap was installed over the building footprint. This SIW was taken out of service and the condensate line leading from the building to the well was disconnected and grouted during the decommissioning and RCRA closure of CPP-633 in 1998.

CPP-110; 33-ICPP; no IDWR number; (CPP-607S).
This SIW was located north of Building CPP-617 and south of Building CPP-607 (see Attachment 4). This well received steam condensate from CPP-607's heating and ventilation system. CPP-607, a 2,560-ft^2 storage building, was decommissioned and dismantled in 1999–2000. The SIW and piping were removed during the decommissioning process and the area was filled with dirt.

DECISION RECOMMENDATION

II. SUMMARY - Qualitative Assessment of Risk:

The level of reliability for the information collected in this report is moderately to highly reliable.

The hazardous substances discharged to the SIWs were identified based on process knowledge. The process knowledge was from interviews with operators that have operated the system since the 1980s and their knowledge of any previous operations data. Actual data records are not available for the early years of operation for the boiler system.

The concentration for the hazardous constituent was conservatively estimated using process knowledge and did not exceed the risk-based concentration based on the EPA Region 9 Preliminary Remediation Goals for screening soil.

Therefore, when this information is plotted on the Qualitative Risk and Reliability Evaluation Table, an intersection in the "no action required" portion of the chart is reached.

III. SUMMARY - Consequences of Error:

False negative error:

The false negative decision error would be to conclude that the contaminated soil remaining below these SIWs pose no unacceptable risk to human health and/or the environment, when in fact they do. This decision would result in no further action being taken at the site when action is warranted. The consequences of this would be fewer controls in place to ensure protection of the public and the environment for the chosen remedial alternative (i.e., no further action), when in fact these controls should be in place. Current plans indicate INTEC is planned to remain in industrial use until 2095 and will not be available for residential use after that timeframe.

False positive error:

The false positive error would be to conclude that the contaminated soil remaining below these SIWs poses an unacceptable risk to human health and/or the environment, when in fact it does not. This decision would result in an inappropriate selection of remedial alternatives (i.e., taking action when none is necessary). If action were taken at these low-risk sites, this would result in the unnecessary expenditure of resources that could be used at higher-risk sites. The SIWs are either inactive or have been removed and all discharge pipes to the wells have been sealed or removed.

IV. SUMMARY - Other Decision Drivers:

While there may be minimal risk from leaving the potentially contaminated soil in the ground, if the contaminated soil were excavated and removed, the risk of exposure potential would be increased. Using a conservative analysis, there are no contaminants with concentrations that approach risk levels that would be unacceptable for human health and they are not readily accessible since they reside at a depth of 3 ft. Current plans indicate INTEC is planned to remain in industrial use until 2095 and will not be available for residential use after that timeframe.

Recommended Action:

These four SIWs should be classified as "No Action" sites. Conservative estimates predict that the hazardous constituent's concentration will not exceed EPA Region 9's Preliminary Remediation Goals concentration value. As CERCLA will take no action, these shallow injection wells will be closed under other regulatory programs. Abandonment of these shallow injection wells will be in accordance with the requirements listed in IDAPA 37.03.09.025.012.a. As sites at INTEC that are recommended for "No Action," they will be evaluated during the OU 3-13 5-year review until such a time as they are addressed in a future Record of Decision, as agreed upon with the Agencies.

Signatures:	**# Pages: 64**	**Date:** 3/24/03
Prepared By: Jodi L Bragassa	**DOE WAG Manager:** Rachel C Hall	
Approved By: DD Kuhns	**Independent Review:** Yvette Hamrick for ORB	

DECISION STATEMENT
(DOE RPM)

Date Received: March 25, 2004

Disposition:

This Track 1 describes four shallow injection wells that received steam condensate from INTEC operations between 1953 and 2001. Records are available for the 1980's to the present but early operations are documented through interviews with personnel familiar with boiler system operations. Corrosion inhibitors and deposit inhibitors containing trisodium phosphate, sodium metabisulfite, cyclohexylamine, diethylethanolamine, morpholine, ethylenediamine tetraacetic acid, acrylic polymer and lignosulfonate were used. There is no record or evidence the chromates were used. Only cyclohexylamine, of the known additives, is listed on the EPA Region IX Remediation Goals table. Conservatively estimated concentrations of soil contaminates ~~were to be~~ compared with risk. The conclusion was no action is required. I support the conclusion and recommend that the wells be abandoned and closed under the state of Idaho's Swallow well abandonment program standards.

Date: March 25, 2004	# Pages: 64
Name: Kathleen Hain	Signature: Kathleen E Hain

DECISION STATEMENT
(EPA RPM)

Date Received: 3-30-04 (FIM-ER-04-065)

Disposition:

Agree no action required under CERCLA. Close wells as specified by Idaho State regulations.

Date: 4-1-04	# Pages: 64
Name: Dennis Faulk	Signature:

DECISION STATEMENT
(STATE RPM)

Date Received:

Disposition:

Track 1 Sites: CP-102, CPP-103, CP-109, and CPP-110.

The Idaho Department of Environmental Quality, Waste Management and Remediation Division, has determined, based on information presented in the March 2004 *Track 1 Decision Document for the Shallow Injection Wells CP-102, CPP-103, CPP-109, and CPP-110 – (EM-ER-04-065)*, that these sites do not pose an unacceptable risk and should be classified as "No Action Required" under the FFA/CO program.

These shallow injection wells will be closed and therefore subject to abandonment procedures under the Idaho Department of Water Resources (IDWR) regulation IDAPA 37.03.09.025.012.a. Conformance with abandonment procedures will be noted during subsequent five-year CERCLA reviews of OU 3-13. The remedial decision for this site will be documented in a future INEEL Record of Decision.

Date: April 27 2004	**# Pages: 64**
Name: Daryl F. Koch	**Signature:** Daryl F Koch

PROCESS/WASTE WORKSHEET
ID: CPP-102/103/109/110

Col 1 Processes Associated With this Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process	
(CPP-102) Steam condensate release for Building CPP-607's heat system and steam tracer system VES-CS-169 (hydrofluoric acid tank).	The steam condensate was dispelled to the SIW through a 1-in. line (CTN-106542).	**Artifact:**	The precast concrete manhole is 5–6 ft deep and fitted with a manhole cover (MAH-CS-LS-091). The piping to this well was removed.
		Location:	The well is located north of Building CPP-617 and south of a hydrofluoric acid tank (VES-CS-169).
		Description:	The SIW received steam condensate through a 1-in. condensate line. The condensate was from Building CPP-607's heating system and possibly from steam tracing the transfer line of the hydrofluoric acid tank. The operational life of CPP-607 was from 1953 to 2000. The line coming from the tank was installed in 1983 and removed in the late 1980s.
(CPP-103) Steam condensate release for Building CPP-665's heat system.	The steam condensate was dispelled to the SIW through a 2-in. line (CTN-106483).	**Artifact:**	The SIW was approximately 3 ft deep. The SIW and piping were removed and the area was filled with dirt.
		Location:	The SIW is located south of Building CPP-656 and north of Building CPP-665.
		Description:	The SIW received steam condensate from Building CPP-665's heating system through a 2-in. condensate line during its operational life of 1980 to 2001.
(CPP-109) Steam condensate release for Building CPP-633's heating system.	The steam condensate was dispelled to the SIW through a 2-in. line (CTN-100242).	**Artifact:**	The approximately 3-ft SIW was taken out of service. The piping leading to the well from Building CPP-633 was grouted.
		Location:	The SIW is located southwest of Building CPP-633.
		Description:	The SIW received steam condensate from Building CPP-633's heating system through a 2-in. condensate line during its operational life of 1960 to 1984.

PROCESS/WASTE WORKSHEET ID: CPP-102/103/109/110			
Col 1 Processes Associated With this Site	**Col 2 Waste Description & Handling Procedures**	**Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process**	
(CPP-110) Steam condensate release for Building CPP-607's heat system.	The steam condensate was dispelled to the SIW through a 1-in. line (CT-NN-155275).	**Artifact:**	The SIW was approximately 3- ft deep. The well was removed and filled with dirt.
		Location:	The SIW is located south of Building CPP-607 and north of building CPP-617.
		Description:	The SIW received steam condensate from Building CPP-607's heating system through a 1-in. condensate line during its operational life of 1953 to 2000.

CONTAMINANT WORKSHEET

SITE ID: CPP-102/103/109/110

PROCESS: Steam condensate release for building heating system **WASTE:** Steam condensate constituents

Col 4 What Known/Potential Hazardous Substance/Constituents Are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 Known/Estimated Concentration of Hazardous Substances/ Constituents[a]	Col 7 Risk-based Concentration (mg/kg)(HQ=1)[b]	Col 8 Qualitative Risk Assessment (hi/med/low)	Col 9 Overall Reliability (high/med/low)
cyclohexylamine	corrosion inhibitor added to steam boiler system	CPP-102 – 1,735 mg/kg CPP-103 – 531 mg/kg CPP-109 – 6,502 mg/kg CPP-110 – 1,735 mg/kg	1.2E+04	Low	High

a. Estimated concentrations are based on the constituent percentage in the boiler system products for the throughput of the boiler system (14.4 million gal/year). Four hundred gallons of Amercor 1848 are used in the system each year and it contains 10-25% cyclohelylamine.

b. Contaminant is listed in the EPA Region 9 Preliminary Remediation Goals InterCalc tables for soils. The table lists pathway-specific values for soils under the residential and industrial land-use scenarios. The figures provided are for the residential land-use scenario.

QUALITATIVE RISK AND RELIABILITY EVALUATION TABLE

	QUALITATIVE RISK		
	Low	Medium	High
highly unreliable	TRACK 2		
highly reliable	No Action Required ■	RI/FS	Interim Action*
reliability	LOW concentration resulting in risk < 10^{-4}	MEDIUM	HIGH concentration resulting in risk > 10-4
	qualitative risk		

■ Risk from contaminants associated with shallow injection well soils

PROCESS: Shallow Injection Wells

Question 1. What are the waste generation processes, locations, and dates of operation associated with this site?

Block 1 Answer:

(CPP-102) – There are currently no waste generation processes associated with this SIW. It was in service to receive steam condensate discharge from approximately 1953 until CPP-607 was decommissioned in 2000. The steam condensate was piped from CPP-607 and the hydrofluoric acid tank to the SIW via a 1-in. pipe[2] (see Attachment 5). The line coming from the tank was believed to be installed in 1983, when the tank went into service, and removed in the late 1980s.[3] Engineering drawings were not found to support the existence of the steam trace line.

(CPP-103) – There are currently no waste generation processes associated with this SIW. It was in service to receive steam condensate discharge from 1980 until CPP-665's deactivation in 2001. During the deactivation activities, the SIW was removed and the area was filled with dirt. The steam condensate was piped from CPP-665 to the SIW via a 2-in. pipe[4] (see Attachment 6).

(CPP-109) – There are currently no waste generation processes associated with this SIW. It was in service to receive steam condensate discharge from 1960 until CPP-633's deactivation in 1984. CPP-633 was closed under an approved HWMA RCRA Closure Plan in 1998, and the pipe leading from the building to the SIW was filled with grout during that time. The steam condensate was piped from CPP-633 to the SIW via a 2-in. pipe[5] (see Attachment 7).

(CPP-110) – There are currently no waste generation processes associated with this SIW. It was in service to receive steam condensate discharge from approximately 1953 until CPP-607 was decommissioned in 2000. The SIW and piping were removed during the decommissioning process and the area was filled with dirt. The steam condensate was piped from CPP-607 to the SIW via a 1-in. pipe[6] (see Attachment 5).

INTEC Steam Process System

The only waste-generating process associated with each SIW was INTEC's steam heating system. The constituent used in the INTEC boiler system prior to the 1980s was trisodium phosphate. After the 1980s and currently, Amersite 2 (corrosion inhibitor); Advantage Plus 1400 (deposit inhibitor), along with trisodium phosphate; and Amercor 1848 (corrosion inhibitor) are used in the system. The current boiler system operators reported that, to the best of their knowledge, chromates were not used during operation of the system[7] (see Attachments 8 and 9). In addition, a brine solution with 10% brine concentration is used in the water softener system.[8]

During operation of the boiler system, only the corrosion inhibitor constituents end up in the condensate. The deposit inhibitor stays in the boiler and is flushed down the service waste line after the system is cleaned. Per the material safety data sheets contained in Attachment 11, Amersite 2 contains sodium metabisulfite (30–40%). Amercor 1848 contains cyclohexylamine (10–25%), diethylethanolamine (10–25%), and morpholine (10–25%). Advantage Plus 1400 contains ethylenediamine tetraacetic acid NA salt (1-10%), adrylic polymer (1-10%), sodium lignosulfonate (1-10%), and organic salt (1-10%). None of the chemicals, except cyclohexylamine are listed on the EPA Region IX Preliminary Remediation Goals table.[9] This table provides the risk-based concentrations for soils under residential and industrial land-use scenarios.

Approximately 400 gal of each corrosion inhibitor product are used in the system each year.[10] The system processes 120 million lb of steam each year to heat the various INTEC facilities. Using the water weight conversion factor of 8.33 lb/gal, the system would produce 14.4 million gal of condensate per year.

Based on conservative assumptions related to each building's configuration and all condensate from the heating of the building being considered, a rough order of magnitude estimate for the amount of condensate over the service life of Building CPP-607 is 200,000 to 500,000[11] gal; the amount of condensate for Building CPP-665 is 630,000 to 655,000[12] gal; and the amount of condensate for Building CPP-633 is 7,776,000 gal.[13]

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one) Explain the reasoning behind this evaluation.

Interviews with personnel intimately familiar with the boiler system provided the information on the products used in the system as corrosion and deposit inhibitors. The personnel have been familiar with the process starting in the 1980s.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one) If so, describe the confirmation.

Engineering drawings confirm the SIW and the process associated with the well, along with operating personnel knowledge. Therefore, this information is considered highly reliable.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☒ **7,8,10**	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☒ **2,4,5,6**	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☒ **13**	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☒ **3,9,11,12**		

PROCESS: Shallow Injection Wells

Question 2. What are the disposal processes, locations, and dates of operation associated with this site? How was the waste disposed?

Block 1 Answer:

There are currently no disposal processes associated with these sites. Steam condensate was dispelled from Building CPP-607 to SIWs CPP-102 and CPP-110 during its operational period, approximately 1953 to 2000. Steam condensate was also dispelled to CPP-102 from CPP-727 (hydrofluoric acid tank) from approximately 1983 to the late 1980s when the line was removed. Steam condensate was dispelled from Building CPP-633 to SIW CPP-109 during its operational period, 1960 to 1984. Steam condensate was dispelled from Building CPP-665 to the SIW CPP-103 during its operational period, 1980 to 2001.[14]

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

The INEEL Comprehensive Facility and Land Use Plan identifies the time frame in which the buildings or structures were in service.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

The Land Use Plan is supported by various information sources and is considered highly reliable.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☐	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☒ 2,4,5,6	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☒ 14		

PROCESS: Shallow Injection Wells

Question 3. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

There is no evidence that a source exists at these sites. SIWs CPP-103 and -110 have been removed, piping to CPP-102 was removed, and piping to CPP-109 was grouted. Conservative estimates of contaminant concentrations in the soil are based on process knowledge and are below risk-based levels.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one) Explain the reasoning behind this evaluation.

The information regarding the sources of each SIW is well documented and is considered highly reliable. Engineering drawings document the abandonment or grouting of condensate lines running to the SIWs. Reliability of the estimates of contaminant concentrations in soil is high because conservative estimates were used based on process knowledge.

Block 3 Has this information been confirmed? ☒ Yes ☐ No (check one) If so, describe the confirmation.

Site observations during 2003 confirm that SIWs CPP-103 and CPP-110 have been filled with clean soil, Building CPP-607 has been removed, and Building CPP-633 has a closure cap installed. Process knowledge was used to conservatively estimate contaminant concentrations in the soil.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☐	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☒ 2,4,5,6	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☐		

PROCESS: Shallow Injection Wells

Question 4. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

By its nature, the condensate released to the SIWs would have migrated downward. No soil data are available; however, conservative estimates of soil concentrations based on process knowledge indicate that the soil would not exceed risk-based concentrations at the source; therefore, migration above risk-based levels is also unlikely.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

In review of groundwater monitoring records from the INEEL Environmental Data Warehouse, there is no evidence of contamination from this constituent at the source.[15] The constituent's estimated concentration is well below EPA's Region 9 Preliminary Remediation Goals for soil at the source; however, no actual sample data is available.

Block 3 Has this information been confirmed? ☒ Yes ☐ No (check one)
If so, describe the confirmation.

During an ICPP inspection of the COCA units in July 1989, an entry was made regarding EPA questioning the liquid flowing through a pipe to the drain south of building CPP-633. The liquid was sampled and found to be thermally hot, radioactively clean, and close to neutral by the pH paper test.[16]

Groundwater monitoring records from the INEEL Environmental Data Warehouse confirm the absence of this contaminant, cyclohexylamine. The Environmental Data Warehouse stores information related to well samples including composite samples taken from multiple wells.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☐	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☐	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☒ 15
Facility SOPs	☐	**Construction data**	☐
OTHER	☒ 9		

PROCESS: Shallow Injection Wells

Question 5. Does site operating or disposal historical information allow estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

These SIWs received the steam condensate from the associated buildings' heating system. The discharges were released to the SIWs and would have dissipated into the soil beneath the wells moving downward towards bedrock. Historical information does not allow estimation of the pattern of potential contamination; however, as identified in Question #6, the contaminant concentration based on process knowledge is estimated to be below the EPA Region 9 Preliminary Remediation Goal for soil.

Block 2 How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one) Explain the reasoning behind this evaluation.

The estimated contaminant concentrations are based on actual operating processes. Additionally, conservative figures were used to evaluate the total volume of condensate that would have been dispelled into each SIW. The total volume figure assumed no condensate recovery, evaporation or biodegradation of the constituent, thus all condensate was dispelled to the SIW.

Block 3 Has this information been confirmed? ☐ Yes ☒ No (check one) If so, describe the confirmation.

No information that documents the daily release is available.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☒ 7	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☒ 2,4,5,6	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☒ 9,11,12		

PROCESS: Shallow Injection Wells

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

The estimated length, width, and depth of the contaminated region are based on the typical SIW with a 3-ft diameter and migration to a depth below the surface of 10 ft, the residential basement scenario. The contamination zone will be a cone-shaped area under the SIW. A migration slope of 1-ft vertical to 1-ft horizontal was assumed. The following calculations for each building are used to determine the worst-case scenario (i.e. all condensate dispelled over the operational life of the building was contained in the contamination zone). The calculations below provide an estimate of the contaminant concentration for each contamination zone.

Building CPP-665, Shallow Injection Well CPP-103

(1) Calculate the volume of the soil in the cone-shaped area in kilograms:

- Assume cone-shaped contamination zone with the cone being 3-ft diameter at top, 17-ft diameter at the bottom, and 7-ft in height (1:1-ft slope down to 10 ft bgs, zone starts at 3 ft bgs)
- The calculated volume of the cone area using the ABE Volume Calculator[17] = 640 ft^3
- Convert cubic feet to cubic centimeter
  640 ft^3 = 18.12 m^3 or 18,122,105 cm^3
- Calculate grams assuming dry bulk soil density = 1.5 g/cm^3
  (18,122,105 cm^3)(1.5 g/cm^3) = 27,183,157 g
- Convert to kilograms:
  27,183,157/1000 = **27,183 kg**

(2) Calculate mass in grams of CPP-665's condensate volume:

- Calculate CPP-665's condensate volume per year, range was 630,000 to 655,000 gal for the 21-year operational life, used highest volume for calculation:
  655,000 gal/ 21 years = **31,190 gal/year**
- Then calculate the percentage of CPP-665 condensate volume based on INTEC's boiler system volume per year to determine the volume of condensate attributed to this specific building. The equation is CPP-665's condensate volume (gal/yr) / boiler system output (gal/yr):
  31,190 gal/14,400,000 gal = .0021 = **.21%**
- Next, calculate the contaminant constituent volume used in the INTEC boiler system per year. The constituent represents a wt% of 10–25% of the corrosion inhibitor product. The higher value (25%) was used for this calculation. The equation is the total gallons of the corrosion inhibitor product used per year times the wt% of the constituent in the product:
  (400 gal)(.25) = 100 gal
- In order to calculate the number of grams of the constituent used in the INTEC boiler system, the equation is the density of the constituent (referenced in the MERCK Index, 12th Edition[18]) times the volume of the constituent times the number of cubic centimeters in a gallon:
  (density of constituent)(volume of constituent)(cm^3 per gallon)
  (0.8647 g/cm^3)(100 gal)(3785.4 cm^3/gal) = **327,324 g**

Block 1 Answer (continued):

- Calculate the milligrams per year of the constituent based on the percentage volume of condensate for CPP-665 times the number of grams of the constituent used in the INTEC boiler system:
  (.0021)(327,324) = 687 g/yr or **687,380 mg/yr**

(3) Calculate the total concentration of the constituent in the contamination zone (3 × 17 × 7 ft). The formula is the grams of constituent per year times the number of operating years divided by the volume of the soil:
(687,380 mg)(21 years)/27,183 kg = **531 mg/kg**

The risk-based concentration level is 12,000 mg/kg for a Hazard Index of 1; therefore, calculate the ratio of the calculated concentration of the constituent divided by the risk-based concentration level.

531 mg/kg/12,000 mg/kg = .044 or less than the Hazard Index of 1 and does not pose a risk.

Building CPP-607, Shallow Injection Well CPP-102 and CPP-110

The constituent concentration arrived at for Building CPP-607 is used for both wells, CPP-102 and CPP-110. This provides a very conservative estimate in that the total concentration is not split amongst the two SIWs and the smaller contamination zone is used (i.e. contamination zone starts at 6ft and ends at 10ft, thus a smaller soil volume captures the contaminant). In addition, since no evidence was available on the exact operating timeframe for venting the steam trace condensate—documents include only a few operating years—accounting for the entire condensate volume from CPP-607 is adequate. The calculation will show that even if all the condensate from the building went to one SIW, the constituent is still well below the EPA Region 9 Preliminary Remediation Goal for soil.

(1) Calculate the volume of the soil in the cone-shaped area in kilograms:

- Assume cone-shaped contamination zone with the cone being 3-ft diameter at top, 10-ft diameter at the bottom, and 4-ft in height (1:1-ft slope down to 10 ft bgs, zone starts at 6 ft bgs)
- The calculated volume of the cone area using the ABE Volume Calculator is = 146 ft^3
- Convert cubic feet to cubic centimeter
  146 ft^3 = 4.13 m^3 or 4,134,105 cm^3
- Calculate grams assuming dry bulk soil density = 1.5 g/cm^3
  (4,134,105 cm^3)(1.5 g/cm^3) = 6,201,158 g
- Convert to kilograms:
  6,201,158/1,000 = 6,201 kg

(2) Calculate mass in grams of CPP-607's condensate volume:

- Calculate CPP-607's condensate volume per year, range was 200,000 to 500,000 gal for the 47-year operational life, used highest volume for calculation:
  500,000 gal/47 years = **10,638 gal/year**
- Then calculate the percentage of CPP-607 condensate volume, based on INTEC's boiler system volume per year, to determine the volume of condensate attributed to this specific building. The equation is CPP-607's condensate volume (gal/yr) / boiler system output (gal/yr):
  10,638 gal/14,400,000 gal = .0007 = **.07%**
- Next, calculate the contaminant constituent volume used in the INTEC boiler system per year. The constituent represents a wt% of 10–25% of the corrosion inhibitor product. The higher value (25%) was used for this calculation. The equation is the total gallons of the corrosion inhibitor product used per year times the wt% of the constituent in the product:

(400 gal)(.25) = 100 gal

Block 1 Answer (continued):

- In order to calculate the number of grams of constituent used in the INTEC boiler system, the equation is the density of the constituent (referenced in the MERCK Index, 12th Edition) times the volume of the constituent times the number of cubic centimeters in a gallon:
  (density of constituent)(volume of constituent)(cm^3 per gallon)
  (0.8647 g/cm^3)(100 gal)(3785.4 cm^3/gal) = **327,324 g**
- Calculate the milligrams per year of the constituent based on the percentage volume of condensate for CPP-607 times the number of grams of the constituent used in the INTEC boiler system:
  (.0007)(327,324) = 229 g/yr or **229,000 mg/yr**

(3) Calculate the total concentration of the constituent in the contamination zone (3 × 10 × 4 ft). The formula is the grams of constituent per year times the number of operating years divided by the volume of the soil:
(229,000 mg)(47 years)/6,201 kg = **1,735 mg/kg**

The risk-based concentration level is 12,000 mg/kg for a Hazard Index of 1; therefore, calculate the ratio of the calculated concentration of the constituent divided by the risk-based concentration level.

1,735 mg/kg/12,000 mg/kg = .145 or less than the Hazard Index of 1 and does not pose a risk.

Building CPP-633, Shallow Injection Well CPP-109

(1) Calculate the volume of the soil in the cone-shaped area in kilograms:

- Assume cone-shaped contamination zone with the cone being 3-ft at top, 17-ft at bottom, and 7-ft in height (1:1-ft slope down to 10 ft bgs, zone starts at 3 ft bgs)
- The calculated volume of the cone area using the ABE Volume Calculator is = 640 ft^3
- Convert cubic feet to cubic centimeters
  640 ft^3 = 18.12 m^3 or 18,122,105 cm^3
- Calculate grams assuming dry bulk soil density = 1.5 g/cm^3
  (18,122,105 cm^3)(1.5 g/cm^3) = 27,183,157 g
- Convert to kilograms:
  27,183,157/1,000 = **27,183 kg**

(2) Calculate mass in grams of CPP-633's condensate volume:

- Calculate the percentage of CPP-633's condensate volume based on INTEC's boiler system volume per year to determine the volume of condensate attributed to this specific building. The equation is CPP-633's condensate volume (gal/yr) / boiler system output (gal/yr):
  324,000 gal/14,400,000 gal = .0225 = **2.25%**
- Next, calculate the contaminant constituent volume used in the INTEC boiler system per year. The constituent represents a wt% of 10–25% of the corrosion inhibitor product. The higher value (25%) was used for this calculation. The equation is the total gallons of the corrosion inhibitor product used per year times the wt% of the constituent in the product:
  (400 gal)(.25) = 100 gal
- In order to calculate the number of grams of the constituent used in the INTEC boiler system, the equation is the density of the constituent (referenced in the MERCK Index, 12th Edition) times the volume of the constituent times the number of cubic centimeters in a gallon:
  (density of constituent)(volume of constituent)(cm^3 per gallon)

(0.8647 g/cm^3)(100 gal)(3,785.4 cm^3/gal) = **327,324 g**

Block 1 Answer (continued):

- Calculate the milligram per year of the constituent based on the percentage volume of condensate for CPP-663 times the number of grams of the constituent used in the INTEC boiler system:
  (.0225)(327,324) = 7,364 g/yr or **7,364,790 mg/yr**

(3) Calculate the total concentration of the constituent in the contamination zone (3 × 17 × 7 ft). The formula is the milligrams of constituent per year times the number of operating years divided by the volume of the soil:
(7,364,790 mg)(24 years)/27,183 kg = **6,502 mg/kg**

The risk-based concentration level is 12,000 mg/kg for a Hazard Index of 1; therefore, calculate the ratio of the calculated concentration of the constituent divided by the risk-based concentration level.

6,502 mg/kg / 12,000 mg/kg = 0.54 or less than the Hazard Index of 1 and does not pose a risk.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one)
Explain the reasoning behind this evaluation.

The EPA Region 9 PRGs tables are widely used for soil contamination remediation.

Block 3 Has this INFORMATION been confirmed? ☐ Yes ☒ No (check one)
If so, describe the confirmation.

No verified analytical data are available from any of the shallow injection well sites; however, information was available for a question asked by EPA in 1989 regarding CPP-109, the shallow injection well near CPP-633. The entry stated that sampling occurred and the liquid was thermally hot, radioactively clean, and close to a neutral by pH paper test. It verified that the liquid was condensate from lines in the WCF facility (see Attachment 10).

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☐	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☐	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☒ **11,12,13,17,18**		

PROCESS: Shallow Injection Wells

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

The quantity of the hazardous substance was estimated in Question #6 (see calculations). The constituent concentration estimate for SIW CPP-103, associated with Building CPP-665, is 531 mg/kg. The concentration estimate for SIW CPP-109, associated with Building CPP-633, is 6,502 mg/kg. The concentration estimate for SIWs CPP-102 and -110, associated with Building CPP-607, is 1,735 mg/kg. The hazardous constituent is based on the throughput of the boiler system used to heat the INTEC facility buildings. The estimates for each building are outlined as follows:

These calculated concentrations were used for the "estimated hazardous constituent concentration," Column 6, on the spreadsheet on Page 8.

The volume of condensate for each site was calculated using several assumptions associated with each building.

Building CPP-607:

The building envelope heat loss was calculated for Building CPP-607, an storage building, using the following :

- wall and roof insulation R-values
- outdoor and indoor design temperatures for storage spaces
- building leakage

Using this information, along with life cycle heating analysis (i.e. heating degree days (HDD) for the site), steam tables for latent heat data at 150 psi (supply) and 20 psi (reduced for heat) steam, and other assumptions included below and including, but not limited to, all of the steam (turned condensate) went to the sump or pit over the life of the building, the total condensate load was calculated.

- The storage building was heated to 50°F, 24 hr/day.
- Building geometry.
- **All** condensate from the heating of the building was considered.
- **Only** condensate from heating the building and steam traps from the supply source was considered.
- Linear life-cycle building degradation affecting building insulation and leakage rate.
- 47 years of operation (heating seasons).

The rough order of magnitude estimate, based on the above assumptions for CPP-607, is 200,000–500,000 gal over the life of the building.

Building CPP-665:

The building envelope heat loss was calculated for Building CPP-665, an occupied office building, using the following:

- wall and roof insulation R-values
- outdoor and indoor design temperatures for personnel comfort
- outdoor air supply requirements based on occupant density

- internal heat gains (lighting, people, etc)
- temperature turn-down (based on work week).

Using this information, along with life cycle heating analysis (i.e. heating degree days (HDD) for the site), steam tables for latent heat data at 150 psi (supply) and 20 psi (reduced for heat) steam, and other assumptions below and including, but not limited to, all of the steam (turned condensate) went to the sump or pit over the life of the building, the total condensate load was calculated.

- The office building was heated to 72°F/ 8 hours a day/5 days a week and 65°F the remaining time.
- Insulation R-values.
- Building leakage.
- Building geometry.
- **All** condensate from the heating of the building was considered.
- **Only** condensate from heating the building and steam traps from the supply source was considered.
- 20 psig steam was used.
- Linear life cycle building degradation affecting building insulation and leakage rate.
- 21 years of operation (heating seasons).

The rough order of magnitude estimate, based on the above assumptions for CPP-665, is 630,000–655,000 gal over the life of the building.

CPP-633:

The Post-Closure Permit Application documents for the Waste Calcining Facility provided a condensate volume of 324,000 gal per year and was in service for 24 years or 7,776,000 gal over the service life.

Block 2 **How reliable are the information sources? ☐ High ☒ Med ☐ Low (check one)**
Explain the reasoning behind this evaluation.

The yearly volumes for the corrosion inhibitor product (400 gal) and the boiler system (14,400,000 gal) are based on actual process data supplied by the operating engineer; however, the calculations for the estimated volume of condensate dispelled during the lifetime of each building were calculated using numerous assumptions.

Block 3 **Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one)**
If so, describe the confirmation.

Interviews with the boiler system's current operating engineer were conducted to ascertain information on the system. No information documenting the quantity of condensate released to each shallow injection well is available.

Block 4 **Sources of Information [check appropriate box(es) & source number from reference list]**

No available information ☐ **Analytical data** ☐

Anecdotal	☐	Documentation about data	☐
Historical process data	☐	Disposal data	☐
Current process data	☐	Q.A. data	☐
Photographs	☐	Safety analysis report	☐
Engineering/site drawings	☐	D&D report	☐
Unusual Occurrence Report	☐	Initial assessment	☐
Summary documents	☐	Well data	☐
Facility SOPs	☐	Construction data	☐
OTHER	☒ 11,12		

PROCESS: Shallow Injection Wells

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

No formal evidence exists that the hazardous constituent is present at the source today. The lines leading to each of the shallow injection wells have been removed or grouted. Building CPP-633 has been closed with a closure cap installed over the building footprint and the condensate line to SIW CPP-109 has been grouted. Building CPP-607 has been completely removed and dismantled. SIW CPP-110, associated with CPP-607, has been removed and filled with soil and the lines leading to SIW CPP-102, also associated with CPP-607, have been removed. CPP-665 is in decommissioning and dismantling status and SIW CPP-103 has been removed and filled with soil. Conservative estimates of contaminant concentration are less than risk-based levels.

Block 2 How reliable are the information sources? ☒ High ☐ Med ☐ Low (check one) Explain the reasoning behind this evaluation.

Engineering drawings document the abandonment or grouting of condensate lines running to the shallow injection wells. Further, interviews with personnel intimately familiar with the decommissioning of the facilities confirm the current status of the condensate lines.

Block 3 Has this INFORMATION been confirmed? ☒ Yes ☐ No (check one) If so, describe the confirmation.

The information regarding the sources of the condensate is well documented and is therefore considered highly reliable.

Block 4 Sources of Information [check appropriate box(es) & source number from reference list]

No available information	☐	**Analytical data**	☐
Anecdotal	☐	**Documentation about data**	☐
Historical process data	☐	**Disposal data**	☐
Current process data	☐	**Q.A. data**	☐
Photographs	☐	**Safety analysis report**	☐
Engineering/site drawings	☒ 2,4,5,6	**D&D report**	☐
Unusual Occurrence Report	☐	**Initial assessment**	☐
Summary documents	☐	**Well data**	☐
Facility SOPs	☐	**Construction data**	☐
OTHER	☐		

REFERENCES

1. DEQ, 2003, Response to INEEL Shallow Injection Well Abandonment Plan, State of Idaho Department of Water Resources, CCN 39827, January 21, 2003

2. Drawing 096452, Rev. 1, *CPP-607 Replace Steam Heaters Flowsheet.*

3. Bragassa, Jodi, Memo with Mike Swenson, Calcine Disposition Support, December 10, 2003.

4. Drawing 095657 Rev. 6, *CPP-665 First Floor Heating and Ventilating and Air Conditioning System.*

5. Drawing 055337 Rev.6, *CPP-Area Underground Utilities Systems.*

6. Drawing 096452 Rev. 1, *CPP-607 Replace Steam Heaters Flowsheet.*

7. Interview Memo with Terry Chesnovar and Ron Garton, INTEC Boiler System Support Engineer, March 18, 2003.

8. Interview Memo with Sandra Carnahan, INTEC Water Boiler System Support Engineer, March 27, 2003.

9. EPA, Region 9 Preliminary Remediation Goals, 2002 Tables, [Electronic database]. 2002. U.S. Environmental Protection Agency. Available: http://www.epa.gov/region09/waste/sfund/prg/index.htm

10. Personal Communication with Terry Chesnovar, INTEC Boiler System Engineer, November 13, 2003.

11. Guillen, Louis, *E-Mail* to Jodi Bragassa Regarding Condensate Volume for Building CPP-607, November 10, 2003.

12. Guillen, Louis, *E-Mail* to Jodi Bragassa Regarding Condensate Volume for Building CPP-665, December 15, 2003.

13. EPA, 2003, *HWMA/RCRA Post Closure Permit for the Idaho Nuclear Technology and Engineering Center Waste Calcine Facility at the Idaho National Engineering Environmental Laboratory, Attachment 3, Section J*, EPA ID No. ID4890008952, Environmental Protection Agency, November 2003.

14. DOE-ID, 1997, *Comprehensive Facility and Land Use Plan*, DOE/ID-10514, Rev. 0, U.S. Department of Energy Idaho Operations Office, December 1997.

15. INEEL Environmental Data Warehouse, [Electronic database]. 2003. INEEL intranet. Available: http://icpweb2/edw2/

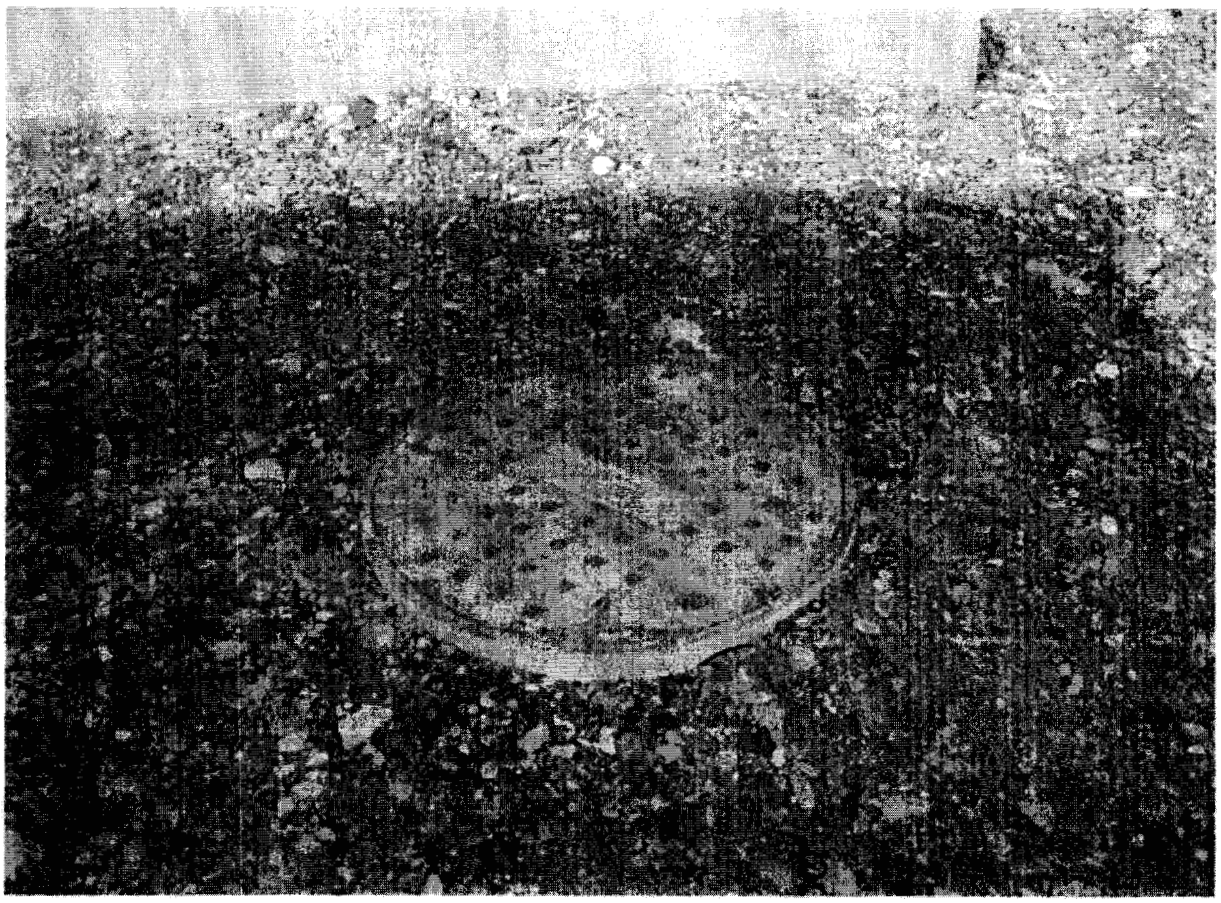
16. Bragassa, Jodi, Memo on Note found Regarding CPP-633's EPA Question during COCA Visit in 1989, November 23, 2003.

17. ABE Volume Calculator, [Electronic database]. 2004. Mississippi State University, Agricultural and Biological Engineering. Available: http://grapevine.abe.msstate.edu/~fto/tools/vol/index.html

18. The MERCK Index, 12th Edition, Merck & Co., Inc., Whitehouse Station, NJ 1996

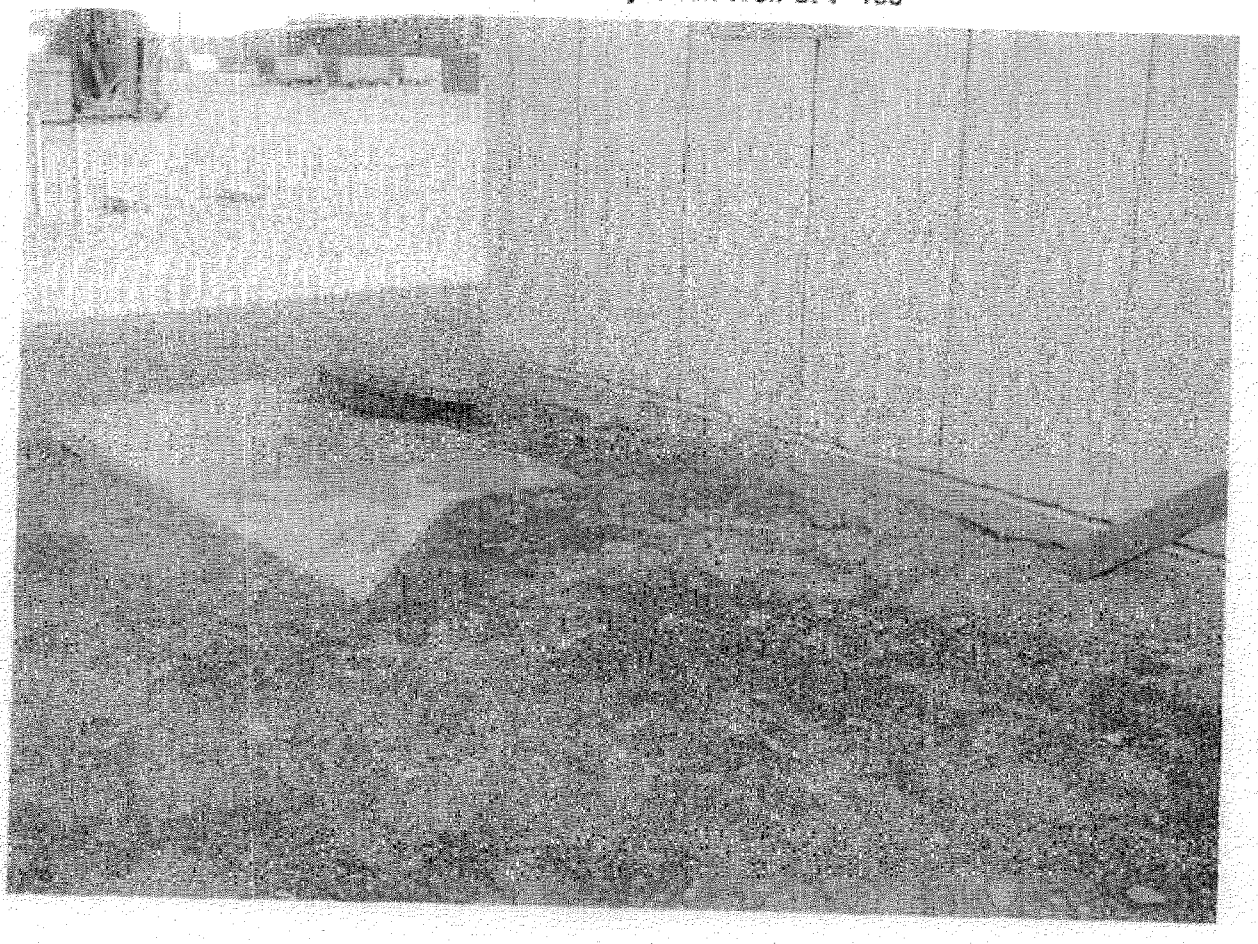
Attachment 1

Photo of Shallow Injection Well CPP-102



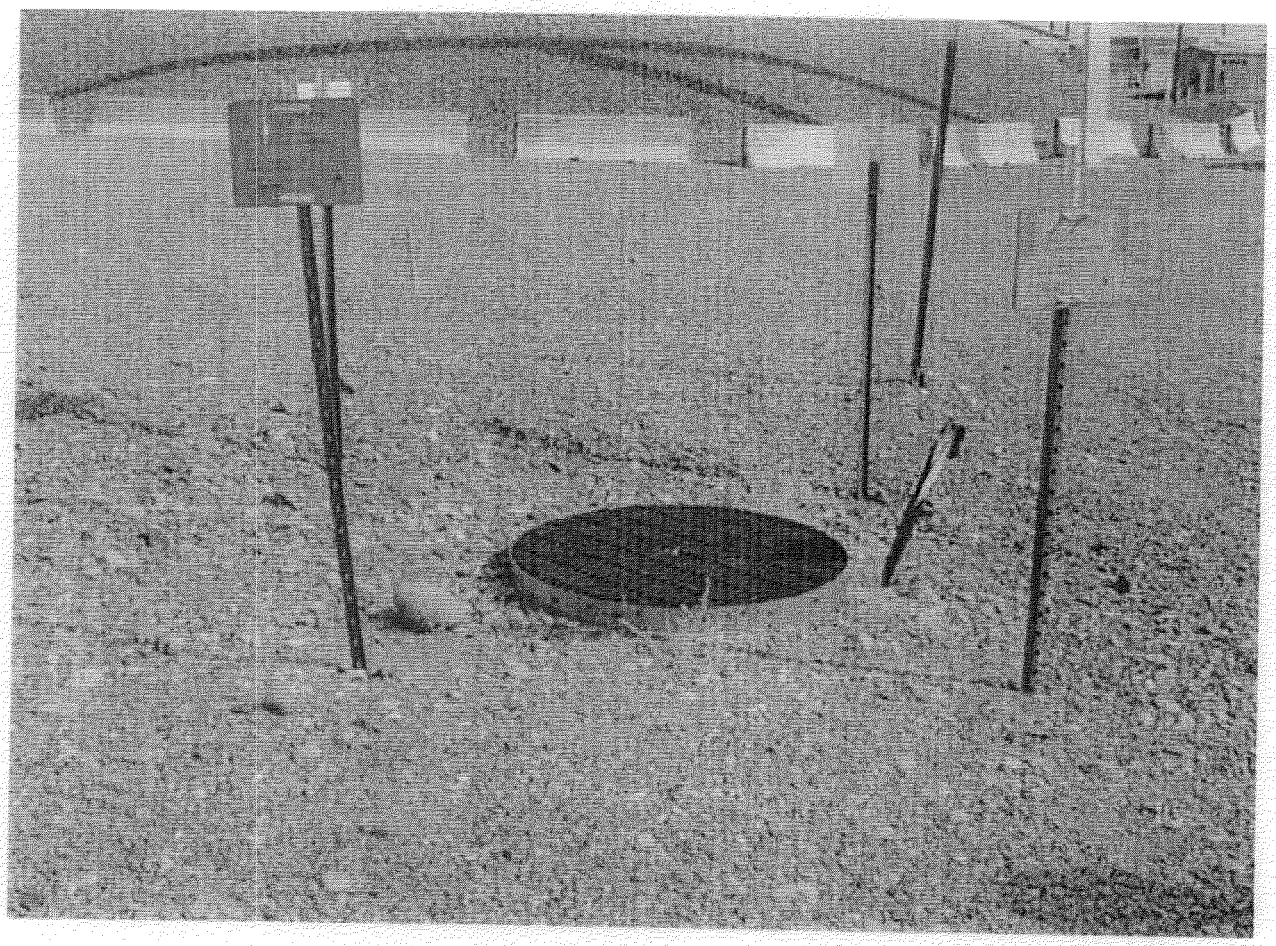
Attachment 2

Photo of Shallow Injection Well CPP-103



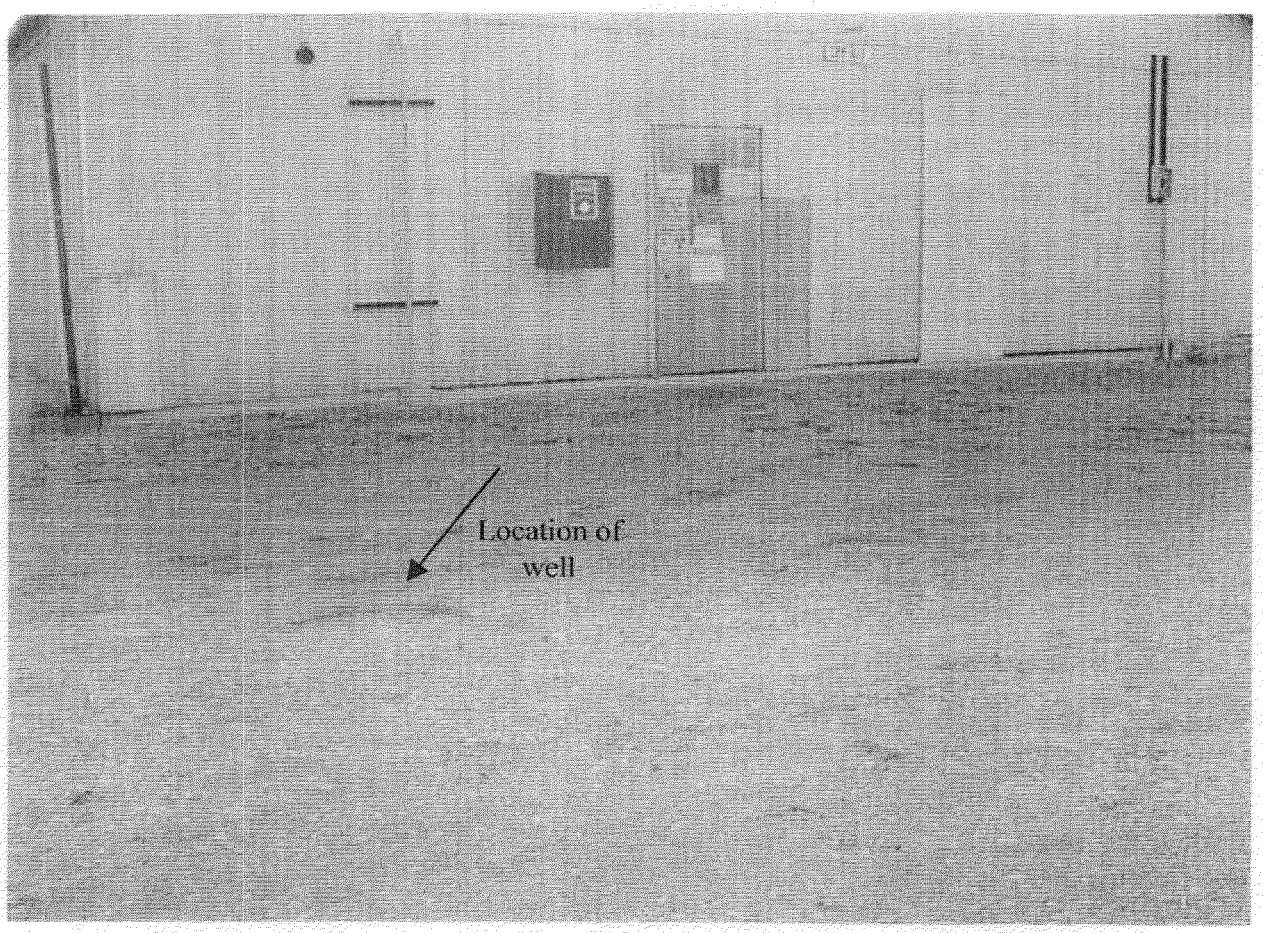
Attachment 3

Photo of Shallow Injection Well CPP-109



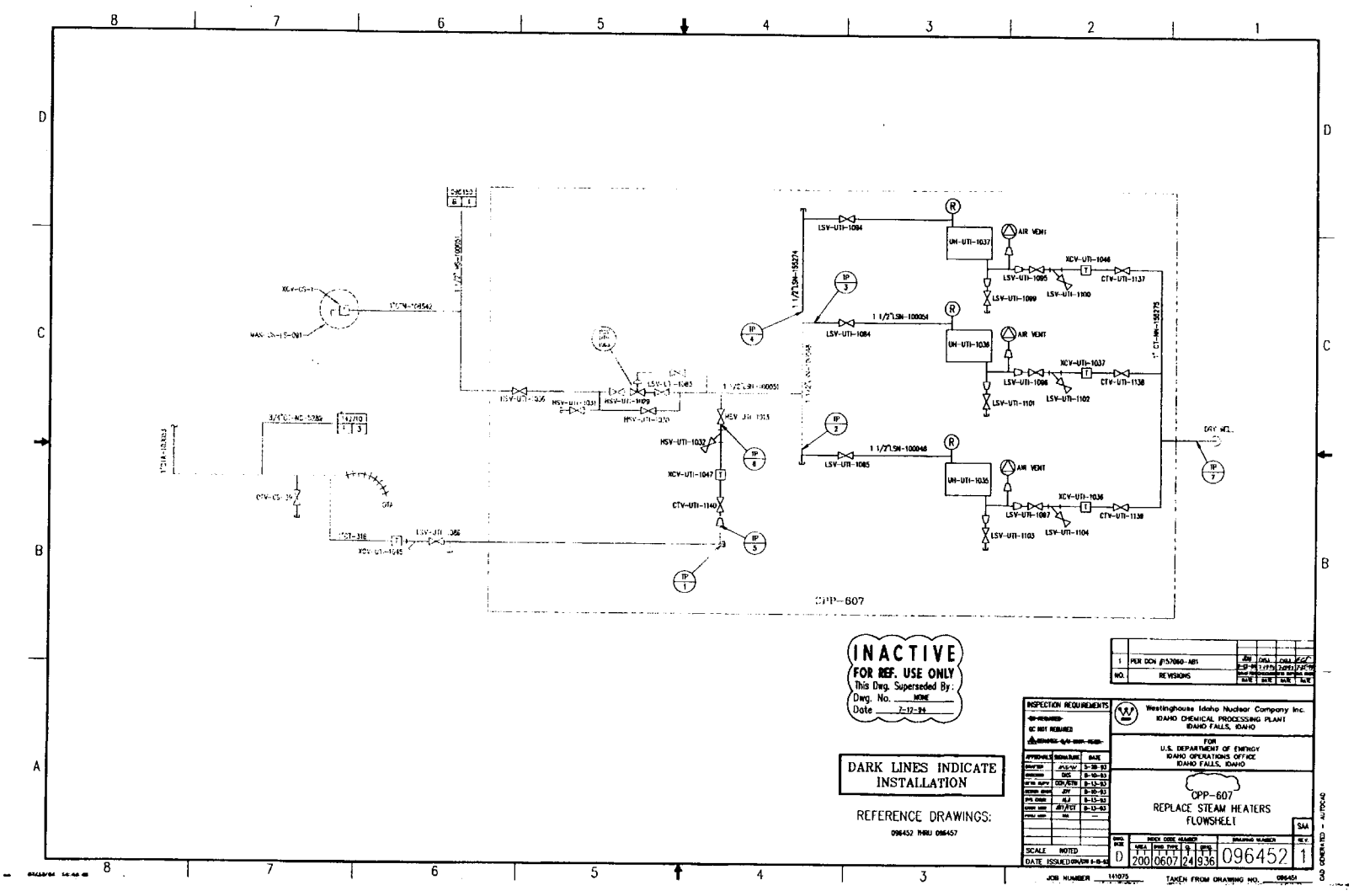
Attachment 4

Photo of Shallow Injection Well CPP-110



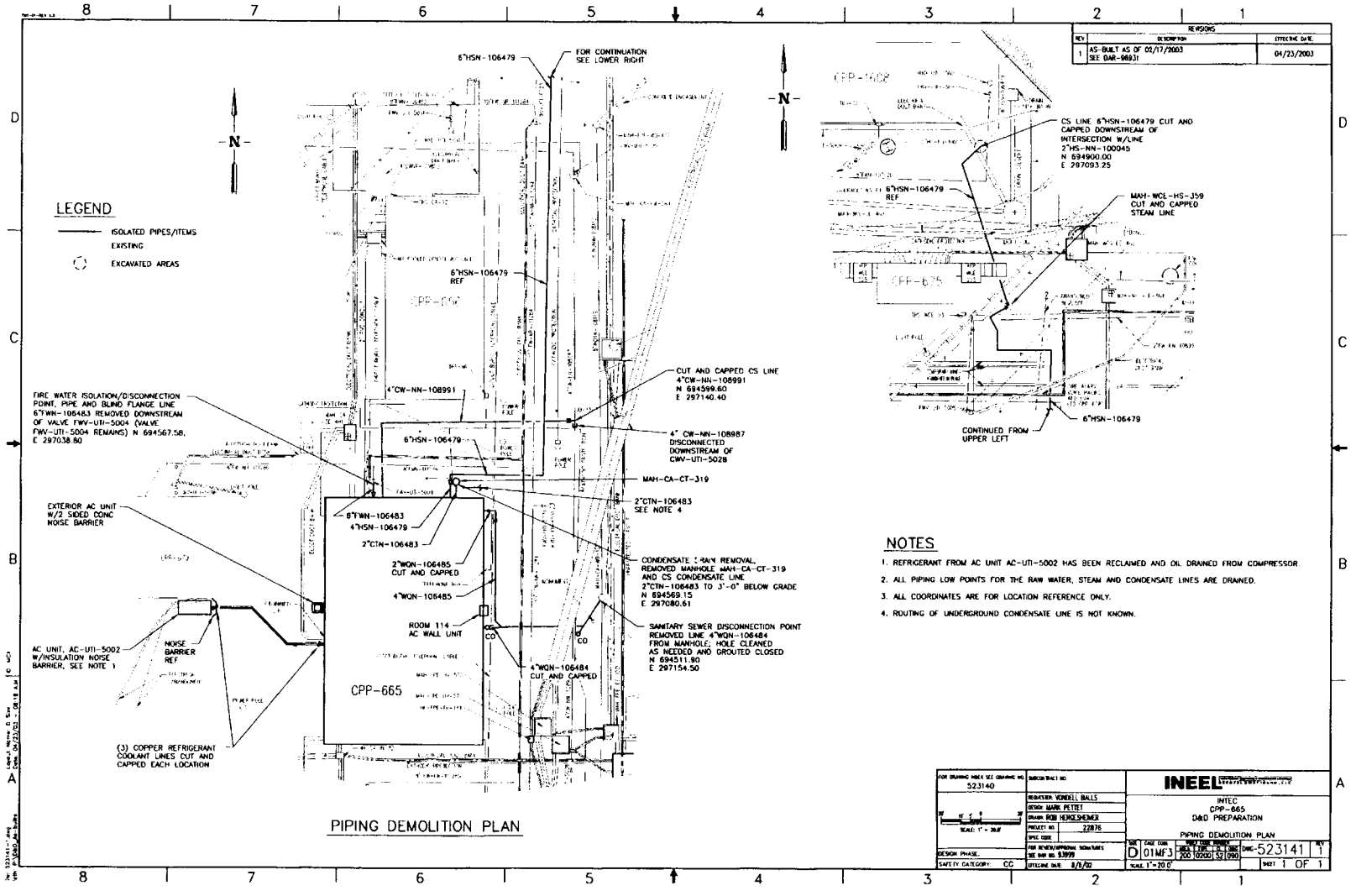
Attachment 5

Drawing of Building CPP-607's Steam Heating Flowsheet



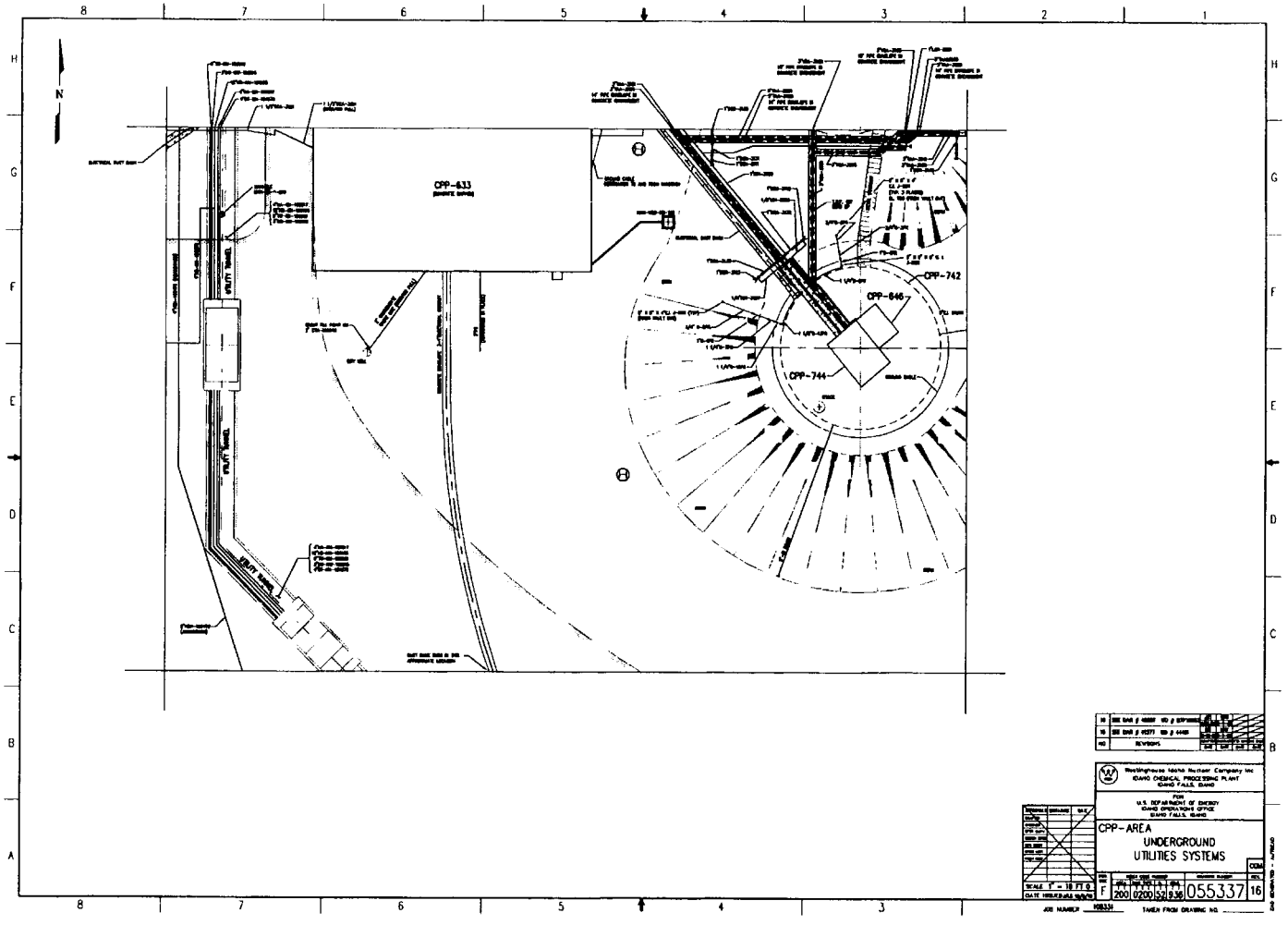
Attachment 6

Drawing of Piping Demolition Plan for CPP-665



Attachment 7

Drawing of the Underground Utilities for CPP-633



Attachment 8

Personal Communication with Terry Chesnovar, INTEC Boiler System Engineer

Chemical Inhibitors used in Boiler System near INTEC CPP-701

Interviewers:	Interviewee:	Date:
Jodi Bragassa & Lee Tuott	Terry Chesnovar	3/18/03

1. *Describe your association with the CPP-701 facility and boiler system.*

An engineer at the INTEC facility. Worked with the boiler system since the early 1980s.

2. *What chemicals are you aware of that were used as chemical inhibitors in the boiler system?*

The product names have changed through the years, but the constituents have not changed significantly since working with the system. The main ingredient used prior to his service was trisodium phosphate. The following products are currently used in the system and could be in the steam condensate: Amersite 2 (corrosion inhibitor); Advantage Plus 1400 (deposit inhibitor); and Amercor 1848 (corrosion inhibitor).

3. *Were chromates used, to your knowledge, in the system?*

To the best of his knowledge, no chromates were used in the boiler and steam system at INTEC.

4. *Was there any other constituent used in the boiler system that would be of significance other than those listed above?*

No.

Attachment 9

Personal Communication with Ron Garton, INTEC Boiler System Engineer

Chemical Inhibitors used in Boiler System near INTEC CPP-701		
Interviewers: Jodi Bragassa	Interviewee: Ron Garton	Date: 3/18/03

6. Describe your association with the CPP-701 facility and boiler system.

Started working at the INEEL in 1983. He was a utilities foreman for 18 years and has been the Steam and Condensate Engineer at INTEC for the last 2 years.

7. What chemicals are you aware of that were used as chemical inhibitors in the boiler system?

The ingredient used prior to his service was trisodium phosphate. During the early 1980s a new contract was put into place and different products were used, but primarily they all contained essentially the same constituents as the products currently used. The products currently being used include: Amersite 2 (corrosion inhibitor and oxygen scavenger); Advantage Plus 1400 (deposit inhibitor) is used along with trisodium phosphate; and Amercor 1848 (corrosion inhibitor) for the steam line.

8. Were chromates used, to your knowledge, in the system?

He is not aware of any chromates being used in the system.

9. Was there any other constituent used in the boiler system that would be of significance other than those listed above?

Not that he is aware of.

Attachment 10

Memo from Jodi Bragassa Regarding Information on French Drain South of CPP-633

Memo:

To: Project File
Subject: Memo from Mike Macconnel regarding well (CPP-109) near CPP-633
Date: 11/22/03
From: Jodi Bragassa

Mike Macconnel dug through a box of information from Gerry Sehlke regarding the shallow injection wells to see if any additional documentation could be located on those wells. He did come across a sheet labeled, "Attachment 5, Questions asked by EPA/State of Idaho During ICPP Inspection of COCA units on 7/27/89". This document is attached to this memo and provides information on the french drain south of CPP-633 or CERCLA site CPP-109.

The memo references a question on the liquid flowing through a pipe to the drain and identifies it as condensate.

ATTACHMENT 5

Questions asked by EPA/State of Idaho
During ICPP Inspection of COCA Units on 7/27/89

SWMU CPP-39: CPP HF Storage Tank (YDB-105) and associated dry well.

EPA stated that there was a potential for someone to dump hazardous waste to the French drain.

WINCO replied that there were no known cases of anyone dumping waste to the French drains.

SWMU CPP-46: CPP-637 Courtyard Pilot Plant Release (Nov 1978).

EPA asked about equipment on the secondary containment of the pilot plant simulated dissolver product holding tanks and also inquired about the containment sump and drain which has a valve and cap termination.

WINCO stated that the equipment was a level detector. (Conductivity probe in sump connected to audible alarm). The containment sump has a stub pipe with valve and cap to enable emptying the basin to other containers by pumping should liquid accumulate from spills or collection of water from rain or snowmelt.

SWMU CPP-48 French drain south of CPP-637

EPA asked about liquid flowing through a pipe to the drain i.e., identification and source. The identity of the liquid was not known during the inspection. WINCO sampled the liquid which was thermally hot, radioactively clean and close to neutral by pH paper test. It was verified that the liquid is condensate from lines in the WCF. Steam valves on heating systems do not enable positive shutoff and occasionally dump condensate to the drain. (NOTE: The drain receiving the condensate is actually adjacent to the SWMU French drain which has been covered.)

SWMU CPP-51: PCB Staging Area West of CPP-660.

EPA asked if any soil was removed from the unit when the PCB equipment was removed.

WINCO responded that it was not known if PCB oil leaked to the ground when oil was apparent on the concrete pad (1985) and that no sampling or excavation was conducted.

Attachment 11

Material Safety Data Sheets for Amercor 1848 Corrosion Inhibitor, Amersite 2 Corrosion Inhibitor, and Advantage Plus 1400 Deposit Inhibitor

1118
C

MATERIAL SAFETY DATA SHEET

Ashland

Date Prepared: 05/01/01
Date Printed: 04/06/02
MSDS No: 999.0275688-003.003

ADVANTAGE PLUS 1400 DEPOSIT INHIBITOR

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: ADVANTAGE PLUS 1400 DEPOSIT INHIBITOR
Product Code:

Company
Ashland
Ashland Distribution Co. &
Ashland Specialty Chemical Co.
P. O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
ETHYLENEDIAMINE TETRAACETIC ACID NA SALT	64-02-8	1.0- 10.0
ACRYLIC POLYMER		1.0- 10.0
SODIUM LIGNOSULFONATE	8061-51-6	1.0- 10.0
ORGANIC SALT		1.0- 10.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness.

Skin
Can cause permanent skin damage. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage. Additional symptoms of skin contact may include: allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects) Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing
Swallowing this material may be harmful or fatal. Symptoms may include severe stomach and intestinal irritation (nausea, vomiting, diarrhea), abdominal pain, and vomiting of blood. Swallowing this material may cause burns and destroy tissue in the mouth, throat, and digestive tract. Low blood pressure and shock may occur as a result of severe tissue injury.

Inhalation
It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing this material may be harmful or fatal.

Continued on next page

DC41602

Symptoms of Exposure
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways).

Target Organ Effects
No data

Developmental Information
This material (or a component) has been shown to cause birth defects in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Cancer Information
There is no information available. The chance of this material causing cancer is unknown. This material is not listed as a carcinogen by the International Agency for Research on Cancer, the National Toxicology Program, or the Occupational Safety and Health Administration.

Other Health Effects
No data

Primary Route(s) of Entry
Inhalation, Skin absorption, Skin contact, Eye contact, Ingestion.

4. FIRST AID MEASURES

Eyes
If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. Seek immediate medical attention.

Skin
Immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. Wash clothing before reuse and discard contaminated shoes.

Swallowing
Seek immediate medical attention. Do not induce vomiting. Vomiting will cause further damage to the mouth and throat. If individual is conscious and alert, immediately rinse mouth with water and give milk or water to drink. If possible, do not leave individual unattended.

Inhalation
If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Continued on next page

Note to Physicians
Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: skin, lung (for example, asthma-like conditions), eye.

5. FIRE FIGHTING MEASURES

Flash Point
Not applicable

Explosive Limit
Not applicable

Autoignition Temperature
No data

Hazardous Products of Combustion
May form: carbon dioxide and carbon monoxide, sodium oxide.

Fire and Explosion Hazards
No special fire hazards are known to be associated with this product.

Extinguishing Media
regular foam, water fog, carbon dioxide, dry chemical.

Fire Fighting Instructions
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 3, Flammability - 0, Reactivity - 1

6. ACCIDENTAL RELEASE MEASURES

Small Spill
Absorb liquid on vermiculite, floor absorbent or other absorbent material. Scoop or scrape up. Put in container for recovery or disposal.

Large Spill
Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source, dike area of spill to prevent spreading, pump liquid to salvage tank. Remaining liquid may be taken up on sand, clay, earth, floor absorbent, or other absorbent material and shoveled into containers.

7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Continued on next page

Storage
Store in closed containers in a dry, well-ventilated area. Keep from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection
Chemical splash goggles and face shield (8" min.) in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist.)

Skin Protection
Wear resistant gloves such as: neoprene, To prevent repeated or prolonged skin contact, wear impervious clothing and boots..

Respiratory Protections
Exposures in the workplace should be monitored to determine if worker exposure to vapor or mist air concentrations exceeds the facility specified exposure "action level" or the use of the product produces adverse health effects or symptoms of exposure. Only a NIOSH/MSHA approved respirator and cartridge (TC-23C) is to be used. Monitoring results must be used to assess the proper level of respiratory protection necessary (such as: full face piece respirator with chemical cartridges or self-contained breathing apparatus (scuba), etc.). Proper engineering and/or administrative controls should be used to reduce worker exposure. The facility's respiratory protection program must meet the requirements established in 29 CFR 1910.134, which includes a program for medical evaluation.

Engineering Controls
Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

Exposure Guidelines
Component

ETHYLENEDIAMINE TETRAACETIC ACID NA SALT (64-02-8)
No exposure limits established

ACRYLIC POLYMER
No exposure limits established

SODIUM LIGNOSULFONATE (8061-51-6)
No exposure limits established

ORGANIC SALT
No exposure limits established

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point
(for component) 212.0 F (100.0 C) @ 760 mmHg

Continued on next page

Vapor Pressure
(for component) 17.500 mmHg @ 68.00 F

Specific Vapor Density
No data

Specific Gravity
1.120 @ 68.00 F

Liquid Density
9.330 lbs/gal @ 68.00 F
1.120 kg/l @ 20.00 C

Percent Volatiles
70.0 - 85.0 %

Volatile Organic Compounds (VOC)
.000 %
.000 g/l
.000 lbs/gal

Evaporation Rate
< 1.00

Appearance
DARK BROWN LIQUID

State
LIQUID

Physical Form
HOMOGENEOUS SOLUTION

Color
DARK BROWN

Odor
NOT DETERMINED

pH
13.0

Freezing Point
28.0 F (-2.2 C)

Octanol/Water Partition Coefficient
> 1.000

10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Continued on next page

Hazardous Decomposition
May form: carbon dioxide and carbon monoxide, sodium oxide.

Chemical Stability
Stable.

Incompatibility
Avoid contact with: copper, reactive metals such as aluminum and magnesium, strong mineral acids, strong oxidizing agents.

11. TOXICOLOGICAL INFORMATION

LD 50 and LC 50 Data

ETHYLENEDIAMINETETRAACETATE, SODIUM SALT (CAS# 64-02-8)
Oral LD50 (male rat): 3030 mg/kg
Dermal LD50 (rabbit): >5000 mg/kg
Inhalation LC50: Not available
SODIUM LIGNOSULFONATE (CAS# 8061-51-6)
Oral LD50 (mouse): 6030 mg/kg
Dermal LD50: Not available
Inhalation LC50: Not available

12. ECOLOGICAL INFORMATION

Ecotoxicological Information
96 hour LC50 rainbow trout (static conditions): 3536.0 mg/l*
96 hour LC50 fathead minnow (static conditions): 2031.0 mg/l*
48 hour LC50 Daphnia magna (static conditions): 3536.0 mg/l*

* Based on a similar product formulation.

Chemical Fate Information
BOD5: 58 ppm*
COD: 490,000 ppm*

* Based on a similar product formulation.

13. DISPOSAL CONSIDERATION

Waste Management Information
Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution Company, IC&S Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101
DOT Description:
NON-REGULATED BY D.O.T.

Continued on next page

Container/Mode:
55 GAL DRUM/TRUCK PACKAGE

NOS Component:
None

RQ (Reportable Quantity) - 49 CFR 172.101
Not applicable

Other Transportation Information
The DOT Transport Information may vary with the container and mode of shipment.

15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

CERCLA RQ - 40 CFR 302.4(a)
None listed

CERCLA RQ - 40 CFR 302.4(b)
This material has a RQ of 100 lbs as a D002 Corrosive unlisted hazardous substance.

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed( ) Fire( ) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65
None

OSHA Process Safety Management 29 CFR 1910
None listed

EPA Accidental Release Prevention 40 CFR 68
None listed

International Regulations

Inventory Status
DSL (CANADA) The intentional ingredients of this product are listed.

State and Local Regulations

California Proposition 65
None

Continued on next page

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page

:0563

MATERIAL SAFETY DATA SHEET

Date Prepared: 07/18/00
Date Printed: 07/18/00
MSDS No: 306.0137818-006.001

AMERSITE 2 CORROSION INHIBITOR

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: AMERSITE 2 CORROSION INHIBITOR
General or Generic ID: CORROSION INHIBITOR

Company
Ashland
Ashland Distribution Co. &
Ashland Specialty Chemical Co.
P. O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

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2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
DIUM METABISULFITE	7681-57-4	30.0- 40.0

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3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness.

Skin
May cause mild skin irritation. Symptoms may include redness and burning of skin.

Swallowing
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful.

Continued on next page

h 15.00 DW

Inhalation
Breathing of vapor or mist is possible.

Symptoms of Exposure
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea) irritation (nose, throat, airways).

Target Organ Effects
No data

Developmental Information
No data

Cancer Information
No data

Other Health Effects
No data

Primary Route(s) of Entry
Inhalation, Skin contact.

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4. FIRST AID MEASURES

Eyes
If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Skin
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

Continued on next page

Swallowing
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

Inhalation
If symptoms develop, immediately move individual away from exposure and into fresh air. Seek immediate medical attention; keep person warm and quiet. If person is not breathing, begin artificial respiration. If breathing is difficult, administer oxygen.

Note to Physicians
Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: lung (for example, asthma-like conditions).

FIRE FIGHTING MEASURES

Flash Point
Not applicable

Explosive Limit
Not applicable

Autoignition Temperature
No data

Hazardous Products of Combustion
May form: sulfur dioxide.

Fire and Explosion Hazards
No special fire hazards are known to be associated with this product.

Continued on next page

Extinguishing Media
water fog, carbon dioxide.

Fire Fighting Instructions
Wear a self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode with appropriate turn-out gear and chemical resistant personal protective equipment. Refer to the personal protective equipment section of this MSDS.

NFPA Rating
Health - 2, Flammability - 0, Reactivity - 0

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6. ACCIDENTAL RELEASE MEASURES

Small Spill
Absorb liquid on vermiculite, floor absorbent or other absorbent material.

Large Spill
Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred. Persons not wearing protective equipment should be excluded from area of spill until clean-up is completed. Stop spill at source. Dike to prevent spreading. Pump to salvage tank.

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7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Continued on next page

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection
Chemical splash goggles in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. Consult your safety representative.

Skin Protection
Wear resistant gloves such as: neoprene, polyvinyl chloride, To prevent repeated or prolonged skin contact, wear impervious clothing and boots., Wear normal work clothing covering arms and legs..

Respiratory Protections
If workplace exposure limit(s) of product or any component is exceeded (see exposure guidelines), a NIOSH/MSHA approved air supplied respirator is advised in absence of proper environmental control. OSHA regulations also permit other NIOSH/MSHA respirators (negative pressure type) under specified conditions (see your industrial hygienist). Engineering or administrative controls should be implemented to reduce exposure.

Engineering Controls
Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below TLV(s).

Exposure Guidelines
Component

SODIUM METABISULFITE (7681-57-4)
OSHA VPEL 5.000 mg/m3 - TWA
ACGIH TLV 5.000 mg/m3 - TWA

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9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point
(for component) 212.0 F (100.0 C) @ 760 mmHg

Continued on next page

Vapor Pressure
(for component) 17.500 mmHg

Specific Vapor Density
> 1.000 @ AIR=1

Specific Gravity
1.300 @ 77.00 F

Liquid Density
10.800 lbs/gal @ 77.00 F
1.300 kg/l @ 25.00 C

Percent Volatiles
55.0 - 70.0 %

Evaporation Rate
SLOWER THAN ETHYL ETHER

Appearance
CLEAR

State
LIQUID

Physical Form
HOMOGENEOUS SOLUTION

Color
PINK

Odor
No data

pH
4.1

Freezing Point
15.0 F (-9.4 C)

Continued on next page

Solubility in Water
SOLUBLE

10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Hazardous Decomposition
May form: sulfur dioxide.

Chemical Stability
Stable.

Incompatibility
Avoid contact with: strong mineral acids, strong oxidizing agents

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

No data

13. DISPOSAL CONSIDERATION

Waste Management Information
Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution Company, IC&S Environmental Services Group at 800-637-7922.

Continued on next page

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14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101
DOT Description:
BISULFITES, AQUEOUS SOLUTIONS, N.O.S.,8,UN2693,III

Container/Mode:
55 GAL DRUM/TRUCK PACKAGE

NOS Component:
SODIUM BISULFITE

RQ (Reportable Quantity) - 49 CFR 172.101
Not applicable

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15. REGULATORY INFORMATION

US Federal Regulations
TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

CERCLA RQ - 40 CFR 302.4(a)
None listed

CERCLA RQ - 40 CFR 302.4(b)
Materials without a "listed" RQ may be reportable as an "unlisted hazardous substance". See 40 CFR 302.5 (b).

SARA 302 Components - 40 CFR 355 Appendix A
None

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed( ) Fire( ) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65
None

Continued on next page

OSHA Process Safety Management 29 CFR 1910
None listed

EPA Accidental Release Prevention 40 CFR 68
None listed

International Regulations
Inventory Status
DSL (CANADA) The intentional ingredients of this product are listed.

State and Local Regulations
California Proposition 65
The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986: This product contains the following substance(s) known to the state of California to cause cancer.
ARSENIC
LEAD
NICKEL
COBALT METAL POWDER

The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act of 1986: This product contains the following substance(s) known to the state of California to cause reproductive harm.
ARSENIC
LEAD

New Jersey RTK Label Information
SODIUM METABISULFITE 7681-57-4

Pennsylvania RTK Label Information
DISULFUROUS ACID, DISODIUM SALT 7681-57-4

Continued on next page

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page

URCE:ASHLAND INC WTR EASYWTR

MATERIAL SAFETY DATA SHEET

Ashland

Date Prepared: 06/28/99
Date Printed: 01/29/00
MSDS No: 306.C249274-007.001

AMERCOR 1848 CORROSION INHIBITOR

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: AMERCOR 1848 CORROSION INHIBITOR
Product Code:
General or Generic ID: CORROSION INHIBITOR

Company
Ashland
Ashland Distribution Co. &
Ashland Specialty Chemical Co.
P. O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
CYCLOHEXYLAMINE	108-91-8	10.0- 25.0
DIETHYLETHANOLAMINE	100-37-8	10.0- 25.0
MORPHOLINE	110-91-8	10.0- 25.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
Can cause permanent eye injury. Symptoms include stinging, tearing, redness, and swelling of eyes. Can injure the cornea and cause blindness. Additional symptoms of eye exposure may include: pain vision (blurred vision around bright objects)

Skin
Can cause permanent skin damage. Symptoms may include redness, burning, and swelling of skin, burns, and other skin damage. Additional symptoms of skin contact may include: allergic skin reaction (delayed skin rash which may be followed by blistering, scaling and other skin effects), Passage of this material into the body through the skin is possible, and skin contact may be harmful.

Swallowing
Swallowing this material may be harmful or fatal. Symptoms may include severe stomach and intestinal irritation (nausea, vomiting, diarrhea, abdominal pain, and vomiting of blood. Swallowing this material may cause burns and destroy tissue in the mouth, throat, and digestive tract. Low blood pressure and shock may occur as a result of severe tissue injury.

Inhalation
Breathing of vapor or mist is possible. Breathing this material may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Continued on next page

Symptoms of Exposure
Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), cough, headache, central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness), nervousness, muscle weakness, effects on blood pressure, chest pain, effects on heart rate, loss of coordination, difficult breathing, methemoglobinemia (blood abnormality which causes a blue coloring to the skin), lung edema (fluid buildup in the lung tissue).

Target Organ Effects
Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: mild, reversible bladder effects, liver abnormalities, effects on male fertility, nasal damage, testis damage, eye damage, kidney damage, liver damage, lung damage.

Developmental Information
This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Cancer Information
No data

Other Health Effects
This material (or a component) has been both positive and negative in tests for mutagenicity. The relevance of this finding to human health is uncertain.

Primary Route(s) of Entry
Inhalation, Skin absorption, Skin contact, Ingestion.

4. FIRST AID MEASURES

Eyes
If material gets into the eyes, immediately flush eyes gently with water for at least 15 minutes while holding eyelids apart. If symptoms develop as a result of vapor exposure, immediately move individual away from exposure and into fresh air before flushing as recommended above. Seek immediate medical attention.

Skin
Immediately flush skin with water for at least 15 minutes while removing contaminated clothing and shoes. Seek immediate medical attention. Wash clothing before reuse and discard contaminated shoes.

Swallowing
Seek immediate medical attention. Do not induce vomiting. Vomiting will cause further damage to the mouth and throat. If individual is conscious and alert, immediately rinse mouth with water and give milk or water to drink. If possible, do not leave individual unattended.

Continued on next page

Sampling and Analysis Plan Table for Chemical and Radiological Analysis

Plan Table Number: WCH-188-03

DRAFT

SAP Number: PLN-1122

Date: 07/01/2003 Plan Table Revision: 2.0 Project: PHASE 1 RFS EFF 28 HOT WASTE TANK Project Manager: DAVIS/CA

Sampler: Nick R. R.

SME/Contact: KROEMER, D. R.

Sample Description						Sample Location				Enter Analysis Types (AT) and Quantity Requested																						
Sampling Activity	Sample Type	Sample Matrix	Coll. Type	Sampling Method	Planned Date	Area	Type of Location	Location	Depth ft	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9	AT10	AT11	AT12	AT13	AT14	AT15	AT16	AT17	AT18	AT19	AT20
										3A	3A	4H																		
SPE117	RESIDG	SLUDGE	COMP			INTEC	VESSEL/PIT	VESSEL OR PLANGE	N/A	2	2	2																		

The sampling screen designation in this table represents the first six characters of the sample identification number.

The complete sample identification number (10 characters) will appear on field collection forms and sample labels.

AT1:	Analysis Suite 1*	AT11:	
AT2:	Analysis Suite 2*	AT12:	
AT3:	Radiochemistry - Suite 1	AT13:	
AT4:		AT14:	
AT5:		AT15:	
AT6:		AT16:	
AT7:		AT17:	
AT8:		AT18:	
AT9:		AT19:	
AT10:		AT20:	

Comments:

Analysis Suites

Analysis Suite 1*: Florisil pesticide, VOCs (Appendix IX TAL), SVOCs (Appendix IX TAL), PCBs

Analysis Suite 2: Arsenic, Total Metals (CLP TAL), Hydrogen ion (pH), Total Organic Carbon, TCLP (VHC Metals)

Radiochemistry - Suite 1: Gross Alpha, Gross Beta, Cesium-137, Strontium-90, Plutonium-238, Plutonium-239/240, Americium-241, Uranium-233/234, Uranium-235, Uranium-238

Containers:

Large Spill
Eliminate all ignition sources (flares, flames including pilot lights, electrical sparks). Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed. Stop spill at source. Prevent from entering drains, sewers, streams or other bodies of water. Prevent from spreading. If runoff occurs, notify authorities as required. Pump or vacuum transfer spilled product to clean containers for recovery. Absorb unrecoverable product. Transfer contaminated absorbent, soil and other materials to containers for disposal. Prevent run-off to sewers, streams or other bodies of water. If run-off occurs, notify proper authorities as required, that a spill has occurred.

7. HANDLING AND STORAGE

Handling
Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed. All five-gallon pails and larger metal containers, including tank cars and tank trucks, should be grounded and/or bonded when material is transferred. Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancer-causing nitrosamines could be formed.

Storage
Keep from freezing.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Eye Protection
Chemical splash goggles and face shield (8" min.) in compliance with OSHA regulations are advised; however, OSHA regulations also permit other type safety glasses. (Consult your industrial hygienist.)

Skin Protection
Wear resistant gloves such as: natural rubber, nitrile rubber. To prevent skin contact, wear impervious clothing and boots., Other protective equipment: eyewash station, emergency shower..

Respiratory Protections
Exposures in the workplace should be monitored if worker exposure to vapor or mists exceeds the PEL or TLV. Only a NIOSH/MSHA approved respirator and cartridge (TC-23C) is to be used. Monitoring results must be used to assess the proper level of respiratory protection necessary (such as: full face piece respirator with chemical cartridges or self-contained breathing apparatus (scuba), etc.). Proper engineering and/or administrative controls should be used to reduce worker exposure. The facility's respiratory program must meet the requirements established in 29 CFR 1910.134, which includes a program for medical evaluation.

Engineering Controls
Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

Continued on next page

Exposure Guidelines
Component

CYCLOHEXYLAMINE (108-91-8)
OSHA VPEL 10.000 ppm - TWA
ACGIH TLV 10.000 ppm - TWA

DIETHYLETHANOLAMINE (100-37-8)
OSHA VPEL 10.000 ppm - TWA (Skin)
ACGIH TLV 2.000 ppm - TWA (Skin)

MORPHOLINE (110-91-8)
OSHA VPEL 20.000 ppm - TWA (Skin)
OSHA VPEL 30.000 ppm - STEL (Skin)
ACGIH TLV 20.000 ppm - TWA (Skin)
ACGIH TLV 30.000 ppm - STEL (Skin)

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point
(for component) 212.0 F (100.0 C) @ 760 mmHg

Vapor Pressure
(for component) 17.500 mmHg @ 68.00 F

Specific Vapor Density
1.000 @ AIR=1

Specific Gravity
.970 @ 77.00 F

Liquid Density
8.089 lbs/gal @ 77.00 F
.970 kg/l @ 25.00 C

Percent Volatiles
100.0

Evaporation Rate
SLOWER THAN ETHYL ETHER

Appearance
CLEAR TO LIGHT AMBER LIQUID

State
LIQUID

Physical Form
No data

Color
CLEAR TO LIGHT AMBER

Continued on next page

Odor
No data

pH
12.5

Freezing Point
-29.0 F (-33.8 C)

10. STABILITY AND REACTIVITY

Hazardous Polymerization
Product will not undergo hazardous polymerization.

Hazardous Decomposition
May form: carbon dioxide and carbon monoxide, nitrogen compounds, various hydrocarbons.

Chemical Stability
Stable.

Incompatibility
Avoid contact with: excessive heat, strong acids, strong oxidizing agents, temperature extremes.

11. TOXICOLOGICAL INFORMATION

No data

12. ECOLOGICAL INFORMATION

Ecotoxicological Information
96 hour LC50 rainbow trout (static conditions): 7071.1 mg/l
96 hour LC50 fathead minnow (static conditions): 947.9 mg/l
48 hour LC50 Daphnia magna (static conditions): 883.9 mg/l

Chemical Fate Information
BOD5: 1,170,000 mg/l
COD: 1,185,000 mg/l

13. DISPOSAL CONSIDERATION

Waste Management Information
Dispose of in accordance with all applicable local, state and federal regulations. For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution Company, IC&S Environmental Services Group at 800-637-7922.

Continued on next page

14. TRANSPORT INFORMATION

DOT Information - 49 CFR 172.101

DOT Description:
AMINES, FLAMMABLE, CORROSIVE, N.O.S.,),UN2924,III

Container/Mode:
55 GAL DRUM/TRUCK PACKAGE

NOS Component:
CYCLOHEXYLAMINE
MORPHOLINE

RQ (Reportable Quantity) - 49 CFR 172.101
Not applicable

15. REGULATORY INFORMATION

US Federal Regulations

TSCA (Toxic Substances Control Act) Status
TSCA (UNITED STATES) The intentional ingredients of this product are listed.

CERCLA RQ - 40 CFR 302.4(a)
None listed

CERCLA RQ - 40 CFR 302.4(b)
Materials without a "listed" RQ may be reportable as an "unlisted hazardous substance". See 40 CFR 302.5 (b).

SARA 302 Components - 40 CFR 355 Appendix A

Section 302 Component(s)	TPQ (lbs)	RQ (lbs)
CYCLOHEXYLAMINE	10000	10000

Section 311/312 Hazard Class - 40 CFR 370.2
Immediate(X) Delayed(X) Fire(X) Reactive( ) Sudden Release of Pressure( )

SARA 313 Components - 40 CFR 372.65
None

OSHA Process Safety Management 29 CFR 1910
None listed

EPA Accidental Release Prevention 40 CFR 68

RMP Component (s)	Condition	TQ (lbs)
CYCLOHEXYLAMINE (CYCLOHEXANAMINE		15000

International Regulations

Inventory Status
Not determined

Continued on next page

State and Local Regulations

California Proposition 65

None

New Jersey RTK Label Information

CYCLOHEXYLAMINE	108-91-8
DIETHYLAMINOETHANOL	100-37-8
MORPHOLINE	110-91-8

Pennsylvania RTK Label Information

CYCLOHEXANAMINE	108-91-8
ETHANOL, 2-(DIETHYLAMINO)-	100-37-8
MORPHOLINE	110-91-8

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances.

Last page